

ON A SUPPOSED NEW SPECIES OF *NOTOTHERIUM*.

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For some time it has appeared with increasing probability that the series of Nototheroid jaws forming part of the Queensland collection includes representatives of a *Nototherium* distinct from *N. mitchelli*, Ow., distinct also from *N. inermis*, Ow., a species which has not as yet been met with by the collectors or friends of the Museum. The suspicion originally based on the very backward position of the inlet of the dental canal in a mandibular fragment, was partially confirmed by a mandible retaining one of its premolars; but this tooth was ground down almost to its base, and although it presented appearances irreconcilable with those which would probably be yielded by a premolar of *N. mitchelli* (as identified by Sir R. Owen) similarly abraded, it did not, or rather could not, in such condition inspire full confidence in its distinctiveness. All such ground for hesitation has however been removed by the acquisition of a lately adult jaw in which the premolar is well preserved; the specific differences displayed by it are obvious, and may be allowed to determine the presence of a third species in the drifts of the Darling Downs, for which may be proposed the name, if an excusable one,

NOTOTHERIUM DUNENSE.

Diagnostic characters:—Tusk-like incisors well developed; premolar (p^3) small, subtriangular, unilobate; inlet of dental canal much behind postmolar angle and much above alveolar level; exterobasal ridges of molars interrupted; talons anterior and posterior well-developed; molars gradually enlarged; inner symphyseal curve opposite hinder lobe of m^1 .

Distinguished from *N. mitchelli*, Ow., by the size and structure of the premolar and position of the inlet of the dental canal ; from *N. inermis*, Ow., by the development of the tusks and consequent retrocession of the symphyisial curve ; from *D. victorie*, Ow., by the position of the inlet of the dental canal and by the gradual enlargement of the molars serially.

Description of a left recently adult mandible (No. 5489) m^3 coming into use. The symphyisial slope makes with the base of the jaw an open angle of 20° ; the upper surface of the symphysis ascends gently from the incisive outlet to the level of the premolar, then descends with a more rapid curve to the vertical of the mid-valley of m^1 ; above its posterior margin is a small subcircular depression for insertion of ligament. The convexity of the inner mandibular wall is at this age feeble, even beneath m^3 ; the concavity of the lower part of the wall is consequently shallow and broad, and confined to the part above the angle, which is feebly reflected and very obtuse. The diastema is equal in length to that of the two anterior true molars ; its edge surmounting the rapidly sloping surface of the symphysis sharp, and it descends with a gentle curve and inclination to the incisive outlet. The alveolar line makes with the diastema a graceful sigmoid curve ; on the outer side anteriorly the mandibular wall descends sheer from the diastemal edge ; on the vertical of d^1-m^1 it becomes convex and it increases in convexity as far as the root of the coronoid process, which, in this stage of growth, springs upwards opposite to the fore lobe of m^3 ; the fore edge of the coronoid plate, so far as it is preserved, inclines forward ; the postmolar platform is as yet incompletely formed ; its inner angle is obtuse and sharp-edged ; its outer end is confluent with a low broad buttress rising with a backward slope upon the side of the ascending ramus ; this convex surface ends abruptly in the fore edge of the inlet of the dental canal, which at this period is distant from the postmolar angle by a space equal to the length of m^1 ; the direction of the inlet is caudo-dorsad ; the anterior orifice of the canal is just anterior to the forefang of the premolar.

Teeth.—The incisor is subprismatic, gently curved and slightly inclined upwards, more strongly outwards, from the incisive outlet; its lower surface broadest and with a shallow median groove; each of its lateral surfaces traversed by a broader and deeper groove; its upper surface much narrower than the lower, convex and ending in the apex of an elongately triangular area of wear, itself ending in a gouge-shaped cutting edge formed by the enamel of the lower surface; the tooth is equal in length to that of d^4 and m^1 together. The premolar p^3 is slightly more than half the length of d^4 , in shape it is an isosceles triangle with rounded angles; it consists of a single lobe bordered on the hinder half of its outer and the whole of its posterior side by a broad cingulum interrupted in the middle of its hinder course by a low link, and on the intero-posterior angle of the tooth curving upwards upon the adjacent angle of the lobe; on the inner side of the fore end of the lobe is a rudimentary pre-basal ridge; the summit of the lobe is degraded by wear into a sub-triangular tract prolonged to a point upon the anterior and intero-posterior angles of the lobe.

The teeth of the molar series become broader by insensible degrees, contrasting in this respect with the sudden increase in breadth attained in *N. victoriae* by the posterior two; as usual in in-adolescent individuals of this genus their lobes incline more and more inward as they recede, the teeth being still in that phase of development in which the posterior molars while moving forwards are revolving upwards towards the horizontal level finally reached. The intero-basal ridges are limited to the closure of the valleys on that side. The exterobasal ridge of m^3 passes uninterruptedly over the hinder lobe, closes the outer entry of the valley, and subsides on reaching the fore lobe; that of m^2 sends up a narrow tongue upon the hind lobe, and in conjunction with the upward curve of the adjacent end of the anterior talon a broad and low one upon the fore lobe. On m^1 the vertical process from the ridge is on the hind lobe, narrower than on m^2 ; on the fore lobe broader than that on the hind lobe, but narrower than that on the fore lobe of m^2 ; on m^1 these processes are about equal in breadth. A strong conical tubercle arms the ridges of m^1 and d^4 as they cross

the entries of the mid-valley. The anterior and posterior talons are broader than the lateral ridges and commence at the inner angle of each tooth. The teeth m^3 and m^2 are of full size, recently brought into mutual contact; their length individually and serially is not diminished by compression. The summits of the lobes of m^3 are touched by wear, but their dentine is not exposed. The lobes of d^4 are more than half worn down, and this tooth was evidently in use, as it is in *N. mitchelli*, before the eruption of the premolar.

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| Length from tip of incisor to entry of dental canal... | 346 mm. |
| Length of molar series | 175 mm. |
| Length of diastema | 70 mm. |
| External height to basal ridge of m^2 | 83 mm. |
| Length of incisor from outlet | 70 mm. |
| Length of p^3 | 17 mm. |
| Breadth of p^3 | 14.5 mm. |
| Length of m^3 | 46 mm. |
| Breadth of m^3 | 29.5 mm. |

The changes which may take place in the jaw of the present species during the progress of adult life may be instructively observed in the example, clearly identified by the premolar, to which allusion has already been made. This fine relic, No. 5451, is a rather aged mandible, wanting the incisive region, coronoid plates, alar expansions, and condyles. The more obvious changes are the increased depth, to the amount of one-sixth, with corresponding thickening of the horizontal ramus and the accentuation of the specific character afforded by the position of the inlet of the dental canal which has now receded from the postmolar angle to a distance equal to the length of m^3 , and has had its aspect turned dorsad by an extension behind it of the ridge which in earlier life it terminated; this ridge now rises to join a convex surface below the condylar process; the outer mandibular wall is much flatter, the convexity passing into the root of the coronoid process commencing rather suddenly beneath m^2 and inferiorly subsiding before reaching the lower edge of the jaw. The coronoid process is now opposite the hinder lobe of m^3 . The postmolar platform

has become a long outwardly sloping area forming with the hinder end of the intra-coronoid groove a broad surface for muscular insertion; its angle is more acute and sharply labiate. The convexity of the hinder part of the inner mandibular wall is much more pronounced consequent upon the development of the fangs of the posterior molars; the concavity beneath is therefore apparently greater, but the reflection of the angle remains as feeble as before; absorption resulting from compression, itself the result of the forward march of the molars, has removed so much of the ante- and post-talons that the entire length of the series is considerably reduced. Since, however, the youngest tooth m^3 is on one side nearly worn down to its basal ridge while the premolar is still in place and function with its fangs intact, it is probable that the forward movement of the teeth is not a rapid one; and from the position of the outlet of the dental canal beneath the forefang of the premolar compared with its position in the much younger individual in which it is barely anterior to that fang, it would seem probable that the progression of the teeth in *Nototherium* is never carried on to the same extent as in the deciduous-toothed Macropods. The extero-lateral ridge of m^3 sends up a vertical process on the hinder lobe and, running further across the fore lobe than in the younger example, forms with the adjacent edge of the ante-talon a low flat process on that lobe also; showing that its condition is liable to individual variation. The premolar is planed down to its base, but enough enamel remains to show as on a plan the limitations of its original form, the single lobe with its pre-basal ridge or lip and post-basal talon; on the inner angle of this, however, a flat surface has been formed which, without the teaching of the more perfect tooth, would have suggested the former presence of a tubercle or small lobe in that position.

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| External height to basal ridge of m^2 | ... | ... | 98 mm. |
| Length of molar series | ... | ... | 166 mm. |
| Length of m^3 ... | ... | ... | 41 mm. |
| Height to sigmoid notch | ... | ... | 203 mm. |
| Length from p^3 to back of condylar process | ... | ... | 287 mm. |

In a third example, No. 5482, the hinder half of a horizontal ramus equal as to age with the one last-mentioned, the following individual differences appear—still greater depth, 117 mm.; increased retrogression of the inlet of the dental canal, and an advance of m^3 slightly beyond the root of the coronoid process. A fourth specimen with m^3 one-third worn has probably been derived from a middle-aged female; it has the same comparatively slender proportions and rounded external form as the young adult male, but the teeth are narrower though not shorter, and the dental canal commences much further from the postmolar angle than the length of m^3 ; the height to the basal ridge of m^2 is 84 mm. The tubercles at the entries of the valleys in m^1 occur again in a fragment with a young tooth of that symbol attached; these tubercles are therefore in the present species occasional, but not, as surmised by Sir R. Owen in the case of *N. victoriae*, constant. Several (six) other more or less mutilated fragments referrible to *N. dunense* occur in the collection; they do not however enable one to add anything to the record.

Upper jaw.—In the number of maxillary fossils which very probably belong to one or other of the Nototheridæ, there is a series which, without fear of grave objection might be adduced as co-specific with the mandibles above-described. But the seeming absence of irreconcilable characters is not, in this case at least, sufficient to establish identity, and until the discovery of jaws naturally associated shall remove all the numerous chances of error besetting the exercise of the judgment in such matters, it is as well to avoid the confusion resulting from the misappropriation of any parts of the skeleton.

EXPLANATION OF PLATE.

Outer and side-views of the left ramus of the lower jaw of *Nototherium dunense*, De V.

Half natural size.)